

REMARKS

Claims 22 to 29 have been cancelled. Claims 30 to 42 have been added.

Claims 1 to 21 and 30 to 43 are currently pending.

Election/Restriction

The Applicant hereby affirms the provisional election made on 12 December 2001 to prosecute claims 1 to 21 (Group 1). Claims 22 to 29 have accordingly been cancelled. The Applicant expressly reserves the right to file a divisional application claiming the subject matter of claims 22 to 29.

Claim Rejections - 35 U.S.C. § 103

The Examiner has rejected claims 1 to 12, 16, 17 and 21 under 35 U.S.C. 103(a) as being unpatentable over Gogoi et al. in view of Fung.

The Examiner rejected claims 13 to 21 under 35 U.S.C. 103(a) as being unpatentable over Gogoi et al. in view of Fung, in further view of Black et al.

Claims 1-20

Gogoi et al., as understood, discloses a pressure sensor having two moveable diaphragms (106, 303) which move in response to an applied pressure. The capacitance between diaphragms (106, 303) and a fixed electrode (203) varies as the diaphragms move. The pressure sensor of Gogoi et al. measures pressure by measuring the capacitance between diaphragms (106, 303) and fixed electrode (203). Movement of the diaphragms with pressure variations is required for the capacitance to vary. Stiction would prevent movement of the diaphragms. This pressure sensor would be rendered inoperable by stiction of the diaphragms to the fixed electrode. Gogoi et al., at column 4, lines 28-34, disclose the use of an anti-stiction process in the manufacture of the pressure sensor.

Gogoi et al. does not disclose any means for heating any part of the sensor. The portion of the description referred to by the Examiner (column 1, lines 63-67 and column 2, lines 1-11) refers to a process for manufacturing the pressure sensor.

Gogoi et al. does not disclose any means for measuring any temperature of any component of the sensor. The Examiner has referred to column 7, lines 9-30 as support for her conclusion that "it is clearly apparent that there is some form of means for monitoring the temperature". Gogoi et al., in column 7, lines 9 -30 merely states some of the various uses for the "semiconductor differential pressure sensing component described herein". In light of the foregoing, the applicant submits that Gogoi et al. fails to suggest "a pressure sensor comprising a member adherent by stiction to a surface of a substrate,

means for heating the member and means for monitoring a temperature of the member" as claimed in claim 1.

Fung, as understood, discloses a semiconductor pressure sensor that determines pressure based on the deformation of and stress on a diaphragm (14). Fung measures resistance change of p-type piezoresistors (18). Piezoresistors (18) are connected to metal contacts (24) by means of p++ interconnections (20). The sensor of Fung includes a silicon oxide layer (16) which forms a dielectric insulator (see column 4, lines 36-40). A substrate (12) supports silicon oxide layer (16) and diaphragm (14). Aluminum bond pads (34, 35) may be connected to metal contacts (24). There is nothing in Fung to suggest "a pressure sensor comprising a member adherent by stiction to a surface of a substrate, means for heating the member and means for monitoring a temperature of the member" as claimed in claim 1.

In light of the failure of Gogoi et al. and Fung to disclose or suggest all of the features of claim 1, the applicant submits that the combination of Gogoi et al. and Fung fails to support the Examiner's conclusion of prima facie obviousness.

Black et al. discloses a plurality of ultra-thin microelectric pressure sensors (17-19). There is nothing in Black et al. to suggest "a pressure sensor comprising a member adherent by stiction to a surface of a substrate, means for heating the member and means for monitoring a temperature of the member" as claimed in claim 1.

None of Gogoi et al., Fung and Black et al. disclose "a pressure sensor comprising a member adherent by stiction to a surface of a substrate", as claimed in claim 1. In fact, Gogoi et al. expressly teaches away from "a pressure sensor comprising a member adherent by stiction to a surface of a substrate". There is nothing in Gogoi et al., Fung or Black et al. which suggests "a pressure sensor comprising ... means for heating the member" as claimed in claim 1. There is nothing in Gogoi et al., Fung or Black et al. which suggests "a pressure sensor comprising ... means for monitoring a temperature of the member", as claimed in claim 1. Claims 2 to 20 all are dependant on claim 1. Accordingly, in light of the above, Gogoi et al., Fung and Black et al. cannot properly form the basis for rejecting claims 1 to 20 under 35 U.S.C. 103(a).

Claim 21

None of Gogoi et al., Fung and Black et al. disclose a pressure sensor having an electrically conductive member in physical contact with a surface of a substrate wherein at least one of: a surface of the electrically conductive member in contact with the substrate; and, a surface of the substrate in contact with the electrically conductive member; has a surface roughness in the range of nanometers to tens of nanometers, as claimed in claim 21. The substrate (101) in the pressure sensor of Gogoi et al. is only in

physical contact with isolation and etch stop layer (102) (hole-widening layer (104) is removed from the completed pressure sensor). The substrate (12) in the pressure sensor of Fung is only in physical contact with silicon oxide layer (16). The Examiner has stated that "it is common to have some degree of roughness due to the etching technique. Hence, a matter of experimental choice as to the exact degree of roughness." However, the Examiner has not cited any prior art that discloses a pressure sensor having all of the features of claim 21. Therefore, the Applicant submits that claim 21 is patentable over the prior art of record.

The New Claims

New claims 30 to 40 are similar to pending claims 1 to 3, 8, 10 to 13, 16, 17 and 19, respectively.

New claims 41 to 43 are similar to pending claim 21, with the addition of an "insulating barrier". Support for this element can be found in the description at page 10, lines 9 to 11. The applicant submits that these claims are patentable over the prior art.

As all of the Examiner's objections have been traversed, the Applicant respectfully requests reconsideration of this application and allowance of pending claims 1 to 21 and 30 to 43.

Respectfully submitted,

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- 6 -

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